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UNIVERSITY INNOVATIVE HUBS AS POINTS OF GROWTH OF INDUSTRIAL PARKS OF UKRAINE

Abstract. The purpose of the article is generalization of features of expediency of the creation of innovative parks in Ukraine. Practical output of the results consists in the discovered success factors of the activity of innovative parks in Ukraine in order to create new opportunities of innovation development of the country.

Current organizational and functional system of innovative entrepreneurship of Ukraine is an imperfect, complex and by all indications, is in the process of formation. It is assumed that infrastructure of international educational innovative hub can structurally corrected according to the area which operates a hub that is: stimulate the dialogue between academics, businessmen and government officials; provide an interactive exchange of explicit and implicit knowledge; generate shared vision on adaptation measures of dynamic environment.

Evaluation of the results of scientific and pedagogical activities of working group of innovative hub should be made for following indicators: development of skills of teaching and research work; introducing of innovative approaches for practical individual activity; formation of innovative approaches for collective practical activity; working on the chosen scientific and methodological theme.

Main advantage of proposed university innovative hubs is that laid all necessary foundations in order to high school could be as soon as effectively integrate the results of university, academic and sectoral sciences of Ukraine, well as advanced research results of scientific world community in the development and implementation of innovative projects and development innovation.

Keywords: educational innovative hub, university innovative hub, industrial parks, innovative project, point of growth, innovation, innovator.

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УНІВЕРСИТЕТСЬКІ ІННОВАЦІЙНІ ХАБИ ЯК ТОЧКИ РОСТУ ІНДУСТРІАЛЬНИХ ПАРКІВ УКРАЇНИ

Анотація. Досліджено індустриальні парки України та дано їх загальну характеристику. Запропоновано авторське бачення змісту програми реалізації інноваційного проекту «університетський інноваційний хаб». Розкрито можливості інноваційної самоідентифікації університетів України шляхом формування освітніх хабів в інноваційному глобальному просторі та їхні взаємовідносини в межах Рамкової програми ЄС з наукових досліджень й інновацій. У ході дослідження було виявлено, що сучасна організаційно-функціональна система інноваційного підприємництва України є недосконалою, складною і за всіма ознаками перебуває на стадії модернізації. Передбачається, що інфраструктура міжнародного освітнього інноваційного хабу може структурно корегуватися відповідно до галузі, в якій функціонує індустриальний парк, що, у свою чергу, закладатиме базис до колективного створення різного роду інновацій з урахуванням потенціалу технологій, техніки, знань й компетенцій; дозволить інтерактивний обмін явними і неявними знаннями; дасть змогу сформуванню спільного бачення щодо заходів адаптації динамічного (гіперзмінного) середовища.

Наведено характерні особливості очікуваних впливів у результаті роботи університетських інноваційних хабів. Оцінку результатів науково-педагогічної діяльності робочої групи інноваційного хабу запропоновано проводити за такими показниками: розвиток навичок науково-дослідної роботи; впровадження інноваційних підходів до практичної індивідуальної та колективної діяльності; робота над обраною науково-методичною темою.

Практична цінність одержаних результатів полягає у виявленні факторів успіху діяльності інноваційних парків на базі університетських хабів з метою створення нових можливостей інноваційного розвитку економіки України. Основна перевага запропонованих університетських інноваційних хабів полягає в тому, що закладені всі необхідні основи для того, щоб вища школа змогла б якнайшвидше інтегрувати результати університетських, академічних та галузевих наук України, а також передові результати досліджень наукової світової спільноти, у реалізацію інноваційних проектів та розвиток інновацій.

Ключові слова: освітній інноваційний хаб, університетський інноваційний хаб, індустриальні парки, інноваційний проект, точка росту, інновація, інноватор.

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УНИВЕРСИТЕТСКИЕ ИННОВАЦИОННЫЕ ХАБЫ КАК ТОЧКИ РОСТА ИНДУСТРИАЛЬНЫХ ПАРКОВ УКРАИНЫ

Аннотация. Исследованы индустриальные парки Украины и дано их общую характеристику. Предложено авторское видение содержания программы реализации инновационного проекта «университетский инновационный хаб». Раскрыты возможности инновационной самоидентификации университетов Украины путем формирования образовательных хабов в инновационном глобальном пространстве и взаимоотношения в рамках Рамочной программы ЕС по научным исследованиям и инновациям. Приведены характерные особенности ожидаемых воздействий в результате работы университетских инновационных хабов.

Ключевые слова: образовательный инновационный хаб, университетский инновационный хаб, индустриальные парки, инновационный проект, точка роста, инновация, инноватор.

Формул.: 0; рис.: 0; табл.: 2; библиограф.: 15.

Introduction. «Triple helix», more precisely collaboration of three types of participants of «innovation game» that represent science, business and state has now for Ukraine critical importance for formation and establishment of innovative economy. In this regard, in the existing institutional changes there is an urgent need to develop theoretical and methodological content of cooperation between university innovative hubs as education, research, innovative and production complexes that based on knowledge and industrial parks of Ukraine and determining of possible mechanisms of its support.

Analysis of research and problem statement. Comprehensive research of institutional support of innovative economy partially represented in the works of Ukrainian and foreign scientists Yu. Bazhal, I. Bakushevych, U. Venesaara [1], Z. Varnalii, O. Harmashova [2], V. Heiets [3], I. Pavlenko [4], J. Youtie, Ph. Shapira [5]. Pleiad of scientists identified two approaches, which are based on economic innovative areas: nationwide level of innovative sphere (V. Denysiuk, H. Kulakov, P. Nikitenko, Yu. Rumyantsev, V. Soloviov, V. Tsylybina [6], L. Fedulova [7]); regional level of innovative sphere (had developed in the works of E. Baark, Sh. Naubahar [8], A. Pavliuk [9] and other scientists).

But at the same time, a significant number of problems associated with the effect of «triple helix» (university — state — business), formation and development of competitiveness of national innovative sphere remains insufficiently open, justified and need solution. Issues connected with the results of the work of such spatio-temporal structures as educational/university innovative hubs in scientific literature to date never been violated.

The aim of this research is the generalization of features and substantiation of expediency of cooperation between industrial parks and university innovative hubs; to determine industrial parks of Ukraine, as perspective points of innovative growth of the country and characteristic features of expected mutual influence as a result of successful work of university innovative hubs within industrial parks; to investigate potential real results of university innovative hubs.

Research results. In the economy of Ukraine period of update of manufacturing technologies is least 15 years despite the fact that today the technology of morally obsolete for 5—7 years, and in the area of electronics, which is core of every technological way — for 2—3 years [6, p. 24—25]. Formation of the system of technological parks in Ukraine has started in 2000. Today in Ukraine are registered 16 technology parks of which actually works 8 [10, p. 167—169]. As part of the National Project «New infrastructure», in particular «industrial park» — the creation of industrial-production infrastructure, formed Register of individual (industrial) parks. Its membership already included 12 parks (*Tabl. 1*), which are presented three types: monospecialized, focused, multidisciplinary [3, p. 201].

Table 1

Development of industrial parks of Ukraine

Name of the industrial park (IP) and its location	Type of the activity (planning volume of investments/ government funding)	Initiator of creation of IP/date of inclusion IP into the Register	Number of new workplaces (term for which was created IP)
1	2	3	4
1. «Valley» (Ivano-Frankivsk region, Valley «Aerodrome») — 29,40 hectares of IP area	Device making, electronics, elements of automotive industry, light and food industry, wood processing, logistics, warehousing (400 million USD)	Dolynska town council Ivano-Frankivsk region/ 03.02.2014	2000 (30)
2. «Slavuta» (Khmelnysk region, Slavuta) — 50,00 hectares of IP area	Metalworking, manufacture of building products, timber industry, processing of animal, food and flavor substances, textile production	Slavuta town council Khmelnytsky region/ 07.02.2014	500 (50)
3. «Lviv Industrial Park Ryasne — 2» (Lviv region, Lviv) — 23,94 hectares of IP area	Woodworking, pulp and paper industry, publishing, manufacture of electrical, electronic and optical equipment, production of rubber (\$100 million)	Lviv town council Lviv region/ 07.02.2014	from 500 to 2500 (50)
4. «Industrial Park «Central» (Poltava region, Kremenchuk, plot type «Greenfield») — 168,55 hectares of IP area	Mechanical engineering, logistics, IT and electronics technology, small and medium business, alternative energy and mechanical engineering (\$422 million)	Kremenchug town council Poltava region/ 01.04.2014	3555 (50)
5. «Industrial Park «Korosten» (Zhytomyr region, Korosten, land type «Greenfield») — 42,20 hectares of IP area	Light industry, automotive, electronics, energy-saving equipment, food industry, logistic center, operates a plant of producing MDF furniture (\$160,8 million)	Korosten town council Zhytomyr region/ 01.04.2014	350 (30)
6. «Svema» (Sumy region, Shostka) — 92,00 hectares of IP area	Chemical production, production of pharmaceutical products, building materials, timber, plastics (\$9 million — for modernizing of infrastructure)	Shostka town council Zhytomyr region/ 06.06.2014	2000 (30)
7. «Solomonovo» (Zakarpattia region, Uzhgorod district, Solomonovo, on territory of SEZ «Zakarpattia») — 66,20 hectares of IP area	Engineering, production of cars (530,2 million USD (infrastructure — 33,1 million, production area — 497,1 million) management company)	LLC «Sezparkservice», LLC «Yevroavtotek», LLC «RIK»/ 06.06.2014	5400 (30)
8. «First Ukrainian Industrial Park» (Kiev region, Brovary district, Great Dyerka) — 105,00 hectares of IP area	Food, pharmaceutical, woodworking, mableve, print production, automotive, metalworking (1,87 billion USD)	LLC «Land Union»/ 09.07.2014	2000 (30)
9. «BIONIC Hill» (Kyiv) — 147,00 hectares of IP area	High technology, energy efficiency, energy conservation (4,45 billion USD)	LLC «Bionics Development»/ 01.09.2014	35000 (39)
10. «iPark» (Odessa region, Kominternovskiy district) — 500,00 hectares of IP area	Processing, instrument-making, petrochemical industry, automotive, robotics (500 million USD)	Stavnitser A. A., Mushynska V. K./ 01.09.2014	1195 (49)
11. «Industrial Park «Kryvbass» (Dnepropetrovsk region, Kryvyi-Rih) — 26,03 hectares of IP area	Engineering, manufacturing construction materials, logistic center, light industry and «hi-tec» (250 million USD)	Kryvyi-Rih Municipality Dnipropetrovsk region/ 01.09.2014	2245 (30)

Sources: [3, p. 202—203; 9, p. 27].

Current organizational and functional system of innovative entrepreneurship of Ukraine is an imperfect, complex and by all indications, is in the process of formation. Holistic scientific and research process is still artificially divided into three categories (sectors): fundamental, departmental and university science. This led to parallelism and «weakening» of scientific research [4, p. 52]. In Ukraine 75 % of fundamental research is carried out in the academic science sector, 13

% each — in industrial and university sectors. Number of performed scientific and technical works in 2015 by entrepreneurial sector is 20785 units, by higher education sector — 7577 units, by organizations of the National Academy of Sciences of Ukraine — 9546 units [4, p. 58; 11, p. 108, 117].

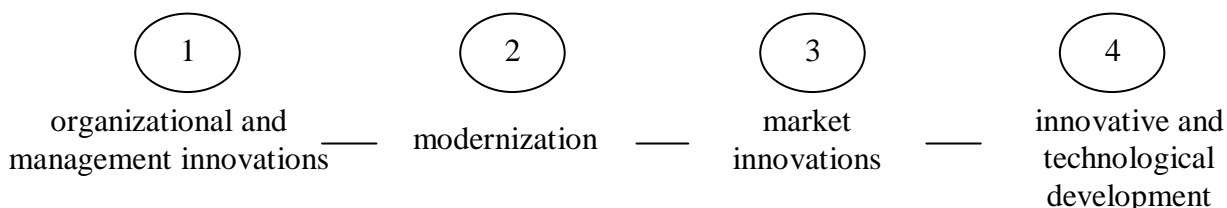
For these reasons, we consider it necessary formation in sector of education university innovative hubs. Implementation of information and consulting, scientific-innovative and production services [12, p. 150; 13, p. 80] in industrial parks, must be rely on international education/university innovative hubs, which in turn must work on the basis of Ukrainian universities as an innovative platform for acceleration of innovative projects. Activity of this kind international educational/university innovative hub should be directed to increase the level and quality of population life particular region of Ukraine in which operates industrial park and resident population in the partner countries of industrial park.

It is assumed that the infrastructure of international educational innovative hub can structurally (or element by element) corrected according to the area which operates industrial park that is: stimulate the dialogue between academics, businessmen and government officials of Ukraine as well as partner countries; form the basis for the collective creation of different innovations taking into account the potential of technology, equipment, knowledge and competencies; provide an interactive exchange of explicit and implicit knowledge; generate shared vision on adaptation measures of dynamic (hyper-variable) environment [14, p. 262].

For successful work of industrial park, university innovative hub must have in its composition centers of generation scientific knowledge and business ideas with a permanent involvement of perspective student young people and centers of preparation of highly qualified specialists and innovators. The activity of university hubs must be aims to work with perspective markets of innovations. Educational innovative hub must be considered as a perspective «growth point of industrial parks» at the base of which is an individual-innovator, student-innovator and institutes of innovative development. The experience of post-industrial countries shows that international university innovative hubs are laying the foundations to:

- emergence of innovative value chain that provides glocalization turnover of resources of industrial park;
- formation of separate national standards in the economy of innovative type under international model;
- appearance in different regions of Ukraine of innovative and powerful knowledge mezo regions with features of innovative globalization that characterized by permeability, velocity, multilevel, reversibility of informational and energy links from innovator of to macro level;
- promotion of knowledge and science of the European Union in part of the implementation of program «Horyzon—2020» and strengthening of innovative glocalization of the economy of Ukraine in the context of innovative globalization through the prism of convergence, congruence and collaboration as a result of dynamization and structural changes of existing science parks.

Mechanism of growth of industrial parks of Ukraine on the basis of educational innovative hubs must take place through the implementation of innovative chain of the next type:



In the first stage industrial parks of innovative sphere must structured their relationships between departments, upgrade staff through professional development in university innovative hubs and attract new professional worker-innovators from hubs, planning and make venture capital investments.

At the stage of modernization of industrial parks it is necessary to update equipments, to launch new production lines, to apply new technology and to create research and development units. To assist to parks in solving these problems will be the same university innovative hubs. The task of hubs — to help in the development of innovative product/service based on borrowed technologies. Simultaneously it should be search for free market niches and introduce computer-aided design.

In the third stage university innovative hubs could help industrial parks to form of marketing and distribution networks, building up logistics chains, to create an optimal marketing policy, to change the package and product design, upgrade and expand the range of products. At this stage it is possible the emergence of vertically integrated holding companies within the industrial park.

The fourth stage is characterized by the search by industrial parks of R&D, creating of corporate R&D institutes and venture funds, attracting specialized research teams from universities hubs. At this stage industrial parks can buy up small innovative enterprises carry out diversification towards high technology market segments that rapidly developing and conducting an active patent licensing policy.

The aim pursued by university hub as points of growth within work of industrial park: ensuring transfer of innovations; achieving commercialization of the results of scientific and research activities; becoming higher educational institutions centers of educational and scientific development of the Southern, Eastern, Western, Northern and Central regions of Ukraine; modernization of the system of professional education institutions; formation of reliable business partnerships between universities of Ukraine and industrial parks.

Detailed programme of the work of hubs in industrial parks includes:

- Development of the infrastructure of projects of industrial parks with the participation of university researchers;
- Formation of the complex system of support of innovative scientific and research activities in higher educational institution;
- Development of the system of Forsyth and forecasting of scientific and technological activities in industrial parks;
- Goals and internal motivation of the development of innovative and entrepreneurship activity in industrial parks;
- Protection of the results of intellectual activity as part of the innovative system of industrial park;
- Conditions of the development of innovative activity of industrial parks;
- Organization transfer and commercialization in industrial parks;
- Construction marketing activity of industrial parks and marketing support of project activity of higher educational institution;
- Promotion the higher educational institution as an international educational innovative hub and its promising developments in Ukraine and abroad;
- Development of technological entrepreneurship: attracting and training of participants, the format of measures, launching projects of industrial parks;
- The relevance of improving of approaches to the financial support of innovations at higher educational institution, sources of financing of innovative entrepreneurial activity of industrial parks;
- Using of information technology in the development of innovative scientific and research activities of industrial parks;
- Information system of management of industrial parks, system of information support of project activity;
- Information system of project management [15, p. 21, 25, 28, 30, 32].

Evaluation of the results of scientific and pedagogical activities of working group of university innovative hub that cooperates with industrial park should be made for following indicators: development of skills of teaching and research work; use of reference materials, research and information sources; creating of the programme, setting goals, objectives, scientific and technical work; introducing of innovative approaches for practical individual activity; formation of

innovative approaches for collective practical activity; working on the chosen scientific and methodological theme; analysis of the results and so on [14, p. 268].

Expected inverse impacts to higher educational institutions as a result of successful work between industrial parks and university innovative hubs to students, teachers and directly institutions of innovative development are positive and presented in Table 2. It is assumed that result of university innovative hubs will be:

- Commercialization of scientific potential of university in industrial parks;
- Output of higher educational institution and enterprises involved to innovative hub in the international market of high technologies;
- Development of links between higher educational institution and business;
- Joining of higher educational institution involving of innovative hub in the global educational and research space;
- Establishing partnerships between Ukrainian and European universities;
- Raising the level of management in higher educational institution, aligning in the project directions in industrial parks;
- Providing particularly important value of innovations in universities — spreading the spirit of innovations;
- Motivation to participate in innovative activity thanks to the presence of youth active in industrial parks;
- The changing nature of interaction with other universities — output to network interaction and the provision of university innovative hub functions of resource hub for other universities and partners [15, p. 22, 24, 39, 53, 69];
- Activity of innovative hub based on industrial park will stimulate the development of environment and culture of innovative entrepreneurship — into students of university, may be able to choose not only the future professional activity, but also to develop their entrepreneurial skills;
- Effective work of innovative hub will give additional impetus internal university mobilization of personnel that will form the nucleus — carriers of new culture, which develop innovative activity and implement its principles in industrial parks. This will create an interesting, skilled, creative and constructive set of like-minded team in industrial park, which will play an important role of youth.

Table 2

Expected impacts as a result of successful work of university innovative hubs

<i>Expected impacts from work of the university innovative hub to students and staff of higher educational institutions</i>	<i>Expected impacts from work of the university innovative hub to institutions of innovative development (including the university, innovative enterprises, institutions of collective investment)</i>
<ul style="list-style-type: none"> - new level of comprehension of their professional position and prospects that opening; - possibility to combine spheres of activities: development of science, education + innovative entrepreneurship; - new strategies and forms of work: with an innovative young scientists and national and international business; - possibility to choose the professional activity in the universities; - new technologies and models of learning; - «depressurization» of conditions and capabilities, overcoming the isolation of students and young scientists; - rethinking of the economic, social and innovative potential of university; - personal growth, development, acquisition of new competencies; - opportunity to participate in a large network, international, interdisciplinary projects and participation in exchange programs. 	<ul style="list-style-type: none"> - establishing of horizontal and vertical links between faculties, universities, enterprises and investors; - intra university mobilization of staff; - new technologies to motivate participation and formation of skills of innovative activity; - opportunities to find an application for young promising personnel and keeping them; - updating the educational program; - image and weight of measures and initiatives, the additional interest in innovative culture of the university and its projects; - development of innovative culture and spread of spirit of innovative activity; - mutually enriching exchange between universities and faculties; - young entrepreneurs for innovative hub and for enterprises of innovative sphere.

Sources: development by authors.

Conclusions. Joint work of industrial parks and university innovative hubs should focus on: training of highly qualified specialists who have professional competence in specific areas of knowledge, skills and experience of innovative entrepreneurship — applying their knowledge in practice of industrial park and the ability to carry out the forecast/forsyth development of their professional field of activity; receiving results of intellectual activity which have simultaneously of heuristic content, potential for improving the quality of life in Ukraine and significant commercial potential.

In our further scientific works we are going to prove the necessity of creating in Ukraine university innovative hubs that will be possible and effectively integrate the results of university, academic and sectoral sciences of Ukraine, well as advanced research results of scientific world community in the development and implementation of innovative projects and development innovations, which is the precondition for being in our country of effective innovative economy.

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